

REMARKS

Claims 17-24 are pending. Claims 17-24 stand rejected. Claims 19-21 and 23 have been amended to correct dependency. Claims 17 and 18 have been amended to limit the polyol constituent to those that are not formed from α,β -ethylenically unsaturated carboxylic acids. Support for this amendment is made with reference to the Examples, wherein no α,β -ethylenically unsaturated carboxylic acid derivative is used. The Examples further illustrate more than one polyol constituent used in the formation of each amphoteric urethane resin. Accordingly, no new matter is introduced with these amendments.

Reply to the Rejection of Claims 19-24 under 35 U.S.C. § 112, 2nd Paragraph

Claims 19-24 have been rejected under 35 U.S.C. §112 as being indefinite. Specifically, the Examiner states that there is insufficient antecedent basis for the reference to claims 1-3 in the claims. Claims 19-21 and 23 have been amended to correct for claim dependency. It is believed that these amendments overcome the Examiner's rejection of claims 19-24 for indefiniteness. Withdrawal, therefore, of this rejection is respectfully requested.

Reply to the Rejection of Claims 17-24 under 35 U.S.C. § 102

Claims 17-24 have been rejected under 35 U.S.C. §102 as being anticipated by International Publication No. WO 00/12588 to Kim *et al.* ("Kim"). Specifically, the Examiner states –

Kim588 discloses a cosmetic composition (e.g., hair fixative) (page 5, lines 27-36) containing a polyurethane formed from a free-radically polymerizable, siloxane-containing urethane (meth)acrylate which comprises, in incorporated form, components a)-d) (page 6, lines 1-18). Component c) can be a diol (page 8, line 46 to page 9, line 11). The urethane (meth)acrylate can additionally comprise component e) which can be a carboxylic acid-containing diol and a tertiary amine-containing diol (page 15, lines 28-30, page 16, lines 7-11, page 17, lines 1-11 and page 34, lines 4-9). The urethane (meth)acrylate can be water-soluble or water dispersible (page 33, line 34 to page 34, line 2). Note that the cosmetic composition can consist essentially of the polyurethane (page 39, lines 11-32). Kim 588 further discloses in Example 4 wherein DMPA is

reacted in the first stage of the reaction, and tBAEMA is reacted in the second stage. Although the tBAEMA is not reacted in the first stage, Claim 18 and dependent claims thereof are product-by-process claims. "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claims is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process" *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). It is noted that US 6 524 564 is the English equivalent of the instant reference. Applicant's arguments have been fully considered but they are not persuasive because as mentioned above, Kim588 does disclose an amphoteric urethane resin prepared by a reaction wherein DMPA and tBAEMA are reacted in separate stages of the reaction.

For the following reasons, Applicants respectfully traverse the Examiner's rejection of claims 17-24 as lacking novelty over Kim.

As previously noted, U.S. Patent No. 6,524,564 ("Kim") is the national stage (35 U.S.C. § 371) filing of International Publication WO 00/12588. Therefore, this reply is based on that disclosure found in the equivalent '564 patent.

Referring to Kim therein is disclosed urethane (meth)acrylates having siloxane groups and able to undergo free-radical polymerization. The siloxane-containing urethane (meth)acrylates of Kim include, in incorporated form -

- a) at least one compound which contains at least one active hydrogen atom and at least one free-radically polymerizable α,β -ethylenically unsaturated double bond per molecule,
- b) at least one diisocyanate,
- c) at least one compound which contains two active hydrogen atoms per molecule,
- d) at least one compound which contains at least one active hydrogen atom and at least one siloxane group per molecule,

and the salts thereof.

(Abstract; col. 4, lines 10-24).

Component a) includes esters formed from the reaction of α,β -ethylenically unsaturated mono- and dicarboxylic acids with dihydric alcohols; esters and amides formed from the reaction of α,β -ethylenically unsaturated mono- and dicarboxylic acids with C₂ to C₁₂ amino alcohols having primary or secondary amino groups (e.g., *t*-

butylaminoethyl (meth)acrylate); amides formed from the reaction of α,β -ethylenically unsaturated mono- and dicarboxylic acids with di- or polyamines having two primary or two secondary or one primary or one secondary amino group(s); and the reaction products of epoxy compounds having at least one epoxy group with the α,β -ethylenically unsaturated mono- and dicarboxylic acids (col. 5, lines 1-63).

Component b) includes customary aliphatic, cycloaliphatic and/or aromatic diisocyanates such as isophorone diisocyanate (col. 5, line 64 – col. 6, line 10).

Component c) includes diols, diamines amino alcohols and mixtures thereof such as polyesterdiols and polyetherols (col. 6, line 11 – col. 7, line 45). Particularly preferred polyesterdiols include reaction products of phthalic acid/diethylene glycol and adipic acid/ethylene glycol (col. 7, lines 23-31).

Component d) includes polysiloxanes of 4 different general formulas (I.1 – I.4) (col. 7, line 46 – col. 10, line 25). Only Formula I.1 teaches a polysiloxane having –OH groups at both terminals, NH₂ groups at both terminals, or an –OH group at one terminal and an NH₂ group at the other terminal (see Z¹ and Z² of Formula I.1; col. 7, line 64 – col. 8, line 7).

In addition to the above four constituents, the urethane (meth)acrylates of Kim can also optionally include at least one component e) having at least one ionogenic and/or ionic group per molecule, e.g., dimethylol propanoic acid (DMPA) (col. 10, line 47 – col. 11, line 61).

The urethane (meth)acrylates of Kim can also optionally include at least one component f) chosen from monohydric alcohols, amines with a primary or secondary amino group, aliphatic, cycloaliphatic or aromatic monoisocyanates and mixtures thereof (col. 11, line 62 – col. 12, line 47).

Finally, the urethane (meth)acrylates of Kim can also optionally include at least one component g) isocyanate (col. 12, lines 48-63).

The urethane (meth)acrylates of Kim can be prepared by reacting at least one diisocyanate component b) and optionally f) and/or g) with the groups of the other components a), c), d) and optionally e) and/or f) that are reactive towards isocyanate groups (col. 13, lines 16-21). The reaction can be carried out with or without solvent (col. 13, lines 28-30).

The invention of Kim further relates to a water-soluble or water-dispersible polymer formed from the polymerization of at least one of the above urethane (meth)acrylates and at least one free-radically polymerizable α,β -ethylenically unsaturated monomer M), wherein M) includes esters of α,β -ethylenically unsaturated mono- and dicarboxylic acids with C₁-C₃₀ alkanols (col. 14, line 36 – col. 20, line 31).

In contrast to Kim, the present application teaches a urethane resin prepared from five components (A) – (E) in which components (D) and (E) are not reacted at the same time with the other components (A) – (C). The amphoteric urethane resin is produced by reaction of either component (D) or (E) with a prepolymer of components (A)-(C) and either (D) or (E). In this manner, an improved urethane resin is obtained that is not obtained when both components (D) and (E) are reacted at the same time.

The Examiner refers to Example 4 of Kim in support of his assertion that Kim anticipates the present application, stating that DMPA is reacted in the first stage and tBAEMA is reacted in the second stage. Example 4 (together with Examples 1-3 and 5) illustrated the preparation of the urethane (meth)acrylates of Kim. Referring to Example 4 of Kim, dimethylolpropanoic acid (DMPA - component D of the present invention and component e) of Kim) is reacted with isophorone diisocyanate (component B of the present invention and component b) of Kim) until the isocyanate group remains constant (col. 27, lines 50-61). Once cooled, polysiloxanediamine (component C) and t-butylaminoethyl methacrylate (t-BAEMA) (component a) of Kim; not taught by the present invention) are added and finally by polyethylene glycol diamine (component A).

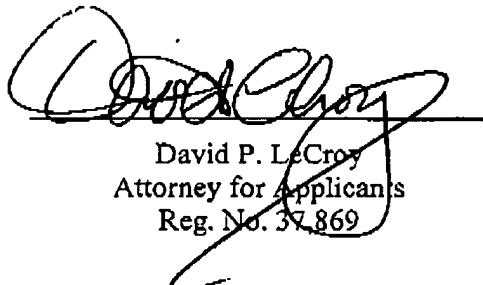
As noted above, t-BAEMA is found in component a) of Kim, which is the compound containing at least one active hydrogen atom and at least one free-radically polymerizable α,β -ethylenically unsaturated double bond per molecule (see col. 5, lines 38-40 of Kim). While t-BAEMA contains a tertiary amino group, it does not contain active hydrogen. Even if t-BAEMA was considered to contain a tertiary amino group and active hydrogen, it is not reacted with a prepolymer formed from components (A) – (D). As noted at page 5 of the present description, when components (D) and (E) are reacted simultaneously with (A) – (C) the carboxyl group of (E) initially forms a salt that is insoluble to the reaction system, so that reaction with the isocyanate compound may not occur, even in the presence of an -OH group. Further, claims 17 and 18 have been

amended to limit the polyol constituent (compound A) to those that are not formed from α,β -ethylenically unsaturated carboxylic acids. Support for this amendment is made with reference to the Examples, wherein no α,β -ethylenically unsaturated carboxylic acid derivative is used.

For at least these reasons, Kim does not teach or suggest each and every element of claims 17-24 and therefore cannot be said to anticipate the presently claimed invention. Withdrawal, therefore of the rejection of claims 17-24 as being anticipated by Kim is respectfully requested.

It is believed that the above amendments and remarks overcome the Examiner's rejections of the claims. Withdrawal of those rejections is respectfully requested. Allowance of the claims is believed to be in order, and such allowance is respectfully requested.

Respectfully submitted,



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